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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/532,178	04/21/2005	Noam Gavriely	Tsivion P7U80	6763
37190 7590 10/03/2008 VARNUM, RIDDERING, SCHMIDT & HOWLETT LLP 333 BRIDGE STREET, NW P.O. BOX 352 GRAND RAPIDS, MI 49501-0352				
EXAMINER				
JANG, CHRISTIAN YONGKYUN				
ART UNIT		PAPER NUMBER		
3735				
MAIL DATE		DELIVERY MODE		
10/03/2008		PAPER		

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

### Office Action Summary

**Application No.**

10/532,178

**Applicant(s)**

GAVRIELI ET AL.

**Examiner**

CHRISTIAN Y. JANG

**Art Unit**

3735

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 7/08/08.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-16 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-16 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/55/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

### DETAILED ACTION

1. This office action is responsive to amendment filed on July 8, 2008. The examiner acknowledges the amendments to claims 1, 3-5, and 16. Claims 1-16 are currently pending in the instant application.

#### ***Claim Rejections - 35 USC § 102***

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claim 8 is rejected under 35 U.S.C. 102(b) as being anticipated by Shapiro et al. (USP #5,957,866).

1. As to claim 8, Shapiro teaches a system for monitoring the interrelated functionality of the heart and the respiratory system, comprising:

at least one means for collecting heart beating sounds (Fig. 3, 12);

means for collecting cyclic sound of the respiratory system classes (Fig. 3, 16),

and

4. a means for processing said sounds (Fig. 3, 30).

5. Claim 16 is rejected under 35 U.S.C. 102(e) as being anticipated by Ho et al. (US 2003/0220578).

6. As to claim 16, Ho teaches a method for improving a magnetic resonance angiography acquisition time is synchronized with the synchronized heart beat ([0019]).

***Claim Rejections - 35 USC § 103***

7. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

8. Claims 1-3 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shapiro et al. (USP 5,957,866) in view of Watrous (USP 6,629,937).

9. As to claim 1, Shapiro teaches a method for analyzing the functionalities of the heart and the respiratory system (Abs), comprising the segmenting of cyclic heart beating and breathing cycle sounds into physically defined classes (col. 3 lines 47-49), associating segments of the same class of said sounds (col. 4 lines 46-51) and correlating physical characteristics of said sounds of the same class (Fig. 9). Shapiro fails to teach that the sounds are segmented while retaining phase information. Watrous teaches device for the evaluation of sounds including heart beats which retain determine the phase of the signal (col. 5 lines 29-33). By retaining the phase information and allowing the classification of measured data by its phase information, Watrous allows for a highly accurate diagnosis, as it is difficult for human listeners to classify sounds by the phases (col. 9 lines 34-47). As such, it would have been obvious to one of ordinary skill in the art to modify the method of analysis taught by Shapiro with the retention of phase information of Watrous to allow for a highly accurate classification of human sound data which cannot be matched with a manual examination.

10. As to claim 2, Shapiro teaches that cyclic heart beating sounds are synchronized by features of an EKG (col. 4 lines 46-51).

11. As to claim 3, Shapiro teaches a method for analyzing a change in the functionality of the heart and respiratory system comprising the identification of respiratory and cardiac sounds (col. 3 lines 40-42), segmenting said sounds (col. 3 lines 47-49), classifying, extracting features, and comparing the features of said classes (col. 7 lines 45-54). and determining the significance (col. 7 lines 54-55). Shapiro fails to teach the segmentation of the sounds in a raw form and extracting time-dependent features. Watrous teaches device for the evaluation of sounds including heart beats which retain determine the phase of the signal (col. 5 lines 29-33). As stated by applicant's response, the retaining of phase data is indicative of a raw signal and the ability to extract time dependent features. By retaining the phase information and allowing the classification of measured data by its phase information, Watrous allows for a highly accurate diagnosis, as it is difficult for human listeners to classify sounds by the phases (col. 9 lines 34-47). As such, it would have been obvious to one of ordinary skill in the art to modify the method of analysis taught by Shapiro with the retention of phase information of Watrous to allow for a highly accurate classification of human sound data which cannot be matched with a manual examination.

12. As to claim 9, the combined teachings of Shapiro and Watrous fail to teach multiple sensors. However, it is extremely common in the field of endeavor to make use of multiple sensors to increase accuracy by redundancy. As such, the examiner gives official notice that it would have been obvious to one of ordinary skill in the art to modify

Shapiro and Watrous make use of multiple sensors in order to boost accuracy and reduce errors to allow for a highly accurate diagnosis.

13. Claims 4-7 and 10-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ho et al. (US 2003/0220578) in view of Shapiro et al. (USP 5,957,866).

14. As to claims 4 and 10, Ho teaches a method for synchronizing a heart beat synchronized system comprising the determination of the temporal signal structure of the heart and sending control signal to the system ([0016]). Ho fails to teach a segmentation of respiratory and cardiac sounds, correlating physical characteristics of said sounds, which are taught by Shapiro as stated previously above (col. 3 lines 40-42; col. 7 lines 45-54). It would have been obvious to one of ordinary skill in the art to modify the method taught by Ho with the segmentation and correlation of physiological sounds taught by Shapiro in order to incorporate respiratory-induced motion factoring to further lower image blurring and thus increase the accuracy of the method.

15. As to claim 5, combined teachings of Ho and Shapiro fail to teach multiple sensors. However, it is extremely common in the field of endeavor to make use of multiple sensors to increase accuracy by redundancy. As such, the examiner gives official notice that it would have been obvious to one of ordinary skill in the art to modify Shapiro and Watrous make use of multiple sensors in order to boost accuracy and reduce errors to allow for a highly accurate diagnosis.

16. As to claim 6, Ho teaches a diagnostic method for synchronizing a heart beat synchronized system ([0006]).

17. As to claim 7, Ho teaches a therapeutic method for synchronizing a heart beat synchronized system ([0019]).

18. As to claim 11-15, Ho teaches a system wherein the system is a monitoring device, an intra-aortic balloon pump, a left ventricular cardiac assist device, a CT coronary angiography diagnostic device, or a SPEC diagnostic device ([0019]).

### ***Response to Arguments***

19. Applicant's arguments with respect to claims 1-16 have been considered but are moot in view of the new ground(s) of rejection.

### ***Conclusion***

20. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to CHRISTIAN Y. JANG whose telephone number is (571)270-3820. The examiner can normally be reached on Mon. - Fri. (8AM-5PM) EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Charles Marmor II can be reached on 571-272-4730. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

CJ  
/C. Y. J./  
Examiner, Art Unit 3735  
9/16/08

/Charles A. Marmor, II/  
Supervisory Patent Examiner  
Art Unit 3735



